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NATIONAL DAM SAFETY PROGRAM. TIMBER LAKE DAM (VA-05918), POTOMA--ETC(U)
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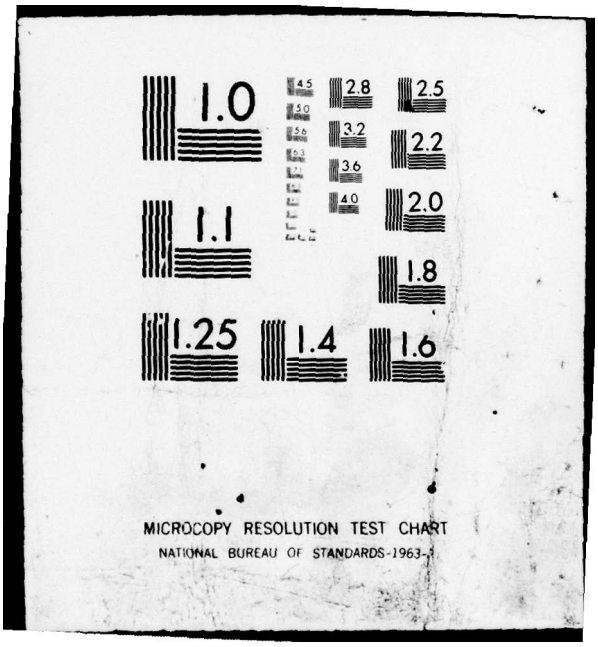
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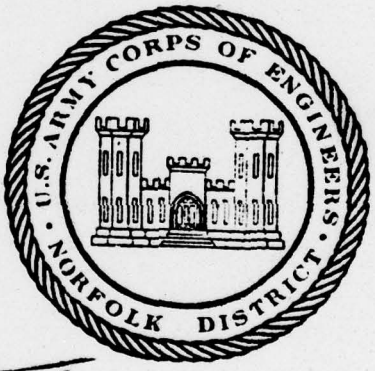
Name Of Dam: TIMBER LAKE DAM
Location: FAIRFAX COUNTY
Inventory Number: VA. 05918

LEVEL II

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



PREPARED FOR

NORFOLK DISTRICT CORPS OF ENGINEERS
803 FRONT STREET
NORFOLK, VIRGINIA 23510

BY

DEWARD M. MARTIN & ASSOCIATES
WILLIAMSBURG, VIRGINIA
AUGUST, 1979

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20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by the Office of Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam and appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

TIMBER LAKE DAM
FAIRFAX COUNTY, VIRGINIA
INVENTORY NO. VA 05918

POTOMAC RIVER BASIN

Name of Dam : Timber Lake Dam
Location : Fairfax County
Inventory Number: VA 05918

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

Prepared for

NORFOLK DISTRICT CORPS OF ENGINEERS
803 Front Street
Norfolk, Virginia 23510

by

Deward M. Martin & Associates, Inc.
July 1979

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

BRIEF ASSESSMENT OF DAM

Name of Dam:	Timber Lake Dam
State:	Virginia
County:	Fairfax
USGS Quad Sheet:	Vienna, Virginia
Stream:	South Fork Run
Date of Inspection:	May 29, 1979

Timber Lake Dam is located in the County of Fairfax west of Vienna. The dam is one half mile north of State Route 627 about 3 miles east of Vale, Virginia. The dam is an earth embankment about 400 feet in length. The dam is 30 feet high from the crest of the embankment to the streambed at the downstream toe of the dam. The top of the dam is 12 feet wide. The dam is classified as small size and significant hazard. The dam is owned by Mr. Joe Young. The purpose of the dam is for recreation i.e. swimming, boating and picnicking. The principal spillway consists of a drop inlet with three sides open connecting to two 24-inch pipes extending through the embankment. There is an emergency spillway located to the left of the dam. This spillway consists of a 150 foot wide grass section with an elevation approximately 6-inches lower than the crest of the dam (see Plate 1, Appendix I.)

Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE) the Spillway Design Flood is the 100-year flood. The principal spillway, together with the emergency spillway, will pass 155% of the Spillway Design Flood without overtopping the dam. The spillway is therefore considered adequate. The stability of the dam cannot be determined since no information on soils for design or construction were available. The stability is therefore questionable. There is a seepage on the face of the dam and wet areas in the flat area below the dam.

Since no information on the design and materials in the dam were known for this Phase I Report, it is recommended that the owner, at his own expense, establish the design and stability of the dam and hence, the safety of his dam.

The owner should establish a program within a period of 12 months from the date of notification by the Governor of the Commonwealth of Virginia, which will lead to remedial measures as noted under Remedial Measures/Recommendations, Section 7. The program and schedule for a reasonable time of completion of remedial measures is to be acceptable to the Commonwealth of Virginia.

Prepared By: Paul Seiler
PAUL SEILER, P.E.
Deward M. Martin & Associates, Inc.

Submitted By: Original signed by JAMES A. WALSH
JAMES A. WALSH, P.E.
Chief, Design Branch

Recommended By: Original signed by: Carl S. Anderson, Jr.
for JACK G. STARR, P.E.
Chief, Engineering Division

Approved By: Original signed by: LTC Leonard C. Gregor
for DOUGLAS L. HALLER
Colonel, Corps of Engineers
District Engineer

Date SEP 27 1979

Top of Dam

Downstream Face of Dam

TIMBER LAKE DAM

TABLE OF CONTENTS

SECTION 1

PROJECT INFORMATION

1.1 General:

1.1.1 Authority: Public Law 92-367, 8 Aug 72 authorized the Secretary of the Army, through the Corps of Engineers to initiate a national program of safety inspections of dams throughout the United States. The Norfolk District has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.

1.1.2 Purpose Of Inspection: The purpose is to conduct a Phase I Inspection according to the Recommended Guidelines for Safety Inspections of Dams (Appendix IV, Reference 1). The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life or property.

1.2 Project Description:

1.2.1 Dam and Appurtenances: Timber Lake Dam is an earth embankment dam 400 feet in length from abutment to abutment. The dam is 30 feet high from the crest of the dam at elevation 345 to the streambed at the downstream toe of the dam. The top of the dam is 12 feet wide. The upstream slope of the dam is 3(H):1(V) and the downstream slope of the embankment is 2(H):1(V).

The lake uses an electrical pump to furnish water from a nearby pond to help maintain the pool level.

The principal spillway is a drop inlet with three open sides connecting to two 24-inch concrete pipes extending through the embankment. There is an emergency spillway located to the left of the dam. This spillway consists of a 150-foot wide grass section with an elevation approximately 6 inches lower than the crest of the dam (see Plate I, Appendix I). Drawdown for the reservoir is accomplished by the use of a siphon.

1.2.2 Location: Timber Lake Dam is located west of Vienna. Access to the dam is by traveling north from U S Route 50 (29/211) along State Route 665 about 2.8 miles to the Community of Vale, Virginia. At the intersection of State Route 672, travel east 2 miles and turn left at the Timber Lake Sign.

1.2.3 Size Classification: The dam is classified as small by a storage capacity of 100 acre feet and a height of 30 feet.

1.2.4 Hazard Classification: The dam is off to the side of South Fork Run. The floodplain downstream from the dam is approximately 400 feet wide. There is an estimated population of 7 people within a mile along the downstream channel. Therefore, the classification is significant in accordance with Section 2.1.2 of the Recommended Guidelines for Safety Inspection of Dams, published by the Department of the Army, Office of the Chief of Engineers (OCE). The hazard classification is a function of location only and has nothing to do with its stability or probability of failure.

1.2.5 Ownership: The Timber Lake Dam is owned by Mr. Joe Young.

1.2.6 Purpose of Dam: Timber Lake is used for recreational purposes i.e. for swimming, boating and picnicking.

1.2.7 Design and Construction History: There are no design plans or construction data available. The dam was built by the owner using the Soil Conservation Service pamphlet as a guideline for design and construction. The dam was built about 1954.

1.2.8 Normal Operational Procedures: The lake is used for recreation. Pool level is maintained by pumping water from a nearby pond. Pumping to keep normal elevation is done as needed by the owner. There is no record of pool elevation maintained. No standard operational procedure is followed.

1.3 Pertinent Data:

1.3.1 Drainage Area: The dam controls a drainage area of 0.1 square miles.

1.3.2 Discharge at Dam Site:

Maximum Flood - Unknown

Principal Spillway
pool level at top of dam . . . . . 145 c.f.s.

Emergency Spillway
pool level at top of dam . . . . . 164 c.f.s.

1.3.3 Dam and Reservoir Data: Pertinent data on the dam and reservoir are shown in the following table:

Table 1.1 DAM AND RESERVOIR DATA

Item	Elevation feet m.s.l.	Reservoir			
		Area, acres	Capacity		Length miles
			Acre, feet	Waterhsed, inches	
Top of Dam	345	10.4	100	19	0.20
Emergency Spillway Crest	344.5	10.0	95	18	0.19
Principal Spillway Crest	341	7.2	60	12	0.15
Streambed at the downstream toe of the dam	315±				

SECTION 2

ENGINEERING DATA

2.1 Design: No information on design and plans are available.

*2.1.1 Geologic Setting of the Dam Site: Timber Lake Dam is located in the Piedmont Geologic Physiographic Province. The underlying bedrock in the site vicinity consists of impure quartzite, metagraywacke, and schist. The formation is bedded with both the dip of the bedding and the foliation moderate to steep. Folding is isoclinical. Prominant joints are about three feet apart. Local joints are closely spaced, especially on fold crests. Soils of this formation are up to 80 feet deep. They consist of micaceious silty sandy soils.

*2.1.2 Geologic Investigations: Discussions with the owner of the dam indicate that no subsurface investigations were undertaken in connection with the original construction.

*2.1.3 Structural Analysis: Original design calculations were not available and no stability analysis was undertaken in connection with this study.

*2.1.4 Construction of the Dam: Mr. Joseph S. Young, the current owner of the dam, had the dam built about 25 years ago to form a recreational lake on his property. A local contractor was hired for the construction. The following is based on information provided by Mr. Young.

According to information provided by the owner, the dam area was cleared and grubbed and a cutoff trench was dug. Mr. Young was not certain of the dimensions of the trench, but said that the trench was not generally terminated in material extremely difficult to excavate. Soil suitable for the dam was not found on the site. Therefore, soil was hau¹ed to the site for the project (Mr. Young was not specific about the criteria used to select soils nor was he certain of the origin of the materials). The dam was constructed as a homogeneous earth dam. There were no compaction specifications. The dam was constructed to a maximum height of about 30 feet with a 3(H):1(V) upstream slope and a 2(H):1(V) downstream slope. The crest was 12 feet wide and about 400 feet long. A small spring was observed at the base of the right abutment prior to construction, according to Mr. Young. Apparently no special measures, such as the installation of drains, were taken to allow for the spring.

2.3 Operation: In 1972, as a result of heavy rain and flooding, the emergency spillway to the left of the dam was eroded. The emergency spillway was repaired shortly after the flood and the drop inlet (principal spillway) and two 24-inch diameter pipes were installed (see Plate 1, Appendix I.)

*Information provided by Law Engineering Associates of Virginia.

2.4 Evaluation: There are no plans or design calculations for the dam and no subsurface investigations were done in relation to its' construction for the dam.

SECTION 3

VISUAL INSPECTION

3.1 Findings:

3.1.1 General: The results of the May 29, 1979 inspection are recorded in Appendix III. At the time of inspection the pool elevation was at 341 m.s.l. The principal spillway consists of a drop inlet which has openings of 1-foot x 2-feet on three sides and two 24-inch diameter concrete culverts. The principal spillway was not passing any flow. There are no known past inspection reports available.

In general the area surrounding the dam is dry and free of debris. Sand has been placed at the waterline of the emergency spillway as a beach for bathers.

*3.1.2 Dam: There was no obvious horizontal or vertical misalignment in the dam. Several small gullies, some starting near the crest of the dam, and some on the downstream slope were observed. These generally seemed to be where foot paths had been worn through the underbrush. The absence of vegetation on the paths has permitted surficial erosion to a depth of about 1 foot. The entire downstream slope was heavily overgrown with trees, mostly hardwoods and underbrush. The trees were an average of 4 inches in diameter. Many trees were observed to have trunks bent in a manner indicating ground movement along the face of the slope. The exposed surface soils on the downstream slope of the dam consisted of tan clayey sandy silt. Several boulders were observed on the downstream slope, near the left abutment, approximately 10 feet above the toe of the dam. The location of the boulders indicated that they were probably part of the original fill (see Plate 1, Appendix I.) Since the crest of the dam is only about 4 feet above normal pool, little of the upstream slope was visible. There was no evidence of deterioration of the visible portion. It should be noted, however, that there was no erosion protection other than grass on the upstream slope. The entire toe of the dam was very spongy and wet with evidence of sloughing. A small pool of water, approximately 3 feet in diameter was observed at the base of the right abutment. This pool was apparently caused by seepage through the dam. About 0.5 gpm was observed flowing into this pool from the area where the fill joins the virgin material. There was some evidence of rusty water in the pool. The rust was apparently from several rusting trash cans lying at the toe of the dam and from the valve housing a valve used as a part of a siphon system. The water seeping into the pool, however, was clear with no evidence of either silt or rust.

*Information provided by Law Engineering Associates of Virginia.

About 100 feet from the right abutment a very wet area was observed on the downstream slope of the dam, about equidistant from the toe and the crest. This area was about 8-feet x 3-feet, the longer dimension being parallel to the axis of the dam. There is evidence of sloughing in this wet area. Other smaller wet areas and sloughs were observed elsewhere on the downstream slope, generally on the lower half of the slope indicating that the phreatic surface exists along the downstream slope about halfway down from the crest.

3.1.3 Spillway: The principal spillway consists of a concrete drop inlet with 1-foot x 2-foot openings (at elevation 341.0) on each of three sides. Two 24-inch diameter concrete pipes run from the drop inlet through the dam.

An emergency spillway is located to the left of the dam. This spillway is approximately 150 feet wide with an elevation 6 inches lower than the crest of the dam (see Plate 1, Appendix I). The spillway is covered with grass, except along the shoreline where sand has been placed for use as a beach.

3.1.4 Instrumentation: There was no instrumentation for Timber Lake Dam.

3.1.5 Reservoir Area: The reservoir area is partially surrounded by dense woods with several areas of beach and open fields. The area downstream of the dam, between the toe and the pump-back pool, was generally damp to soggy. There were no boils or evidence of flowing water.

3.2 Evaluation: The visual observation indicated there was seepage on the downstream face of the dam, a slight slough at the seepage area and a fairly heavy growth of trees of about 4 inches in diameter. The principal and emergency spillway are in good condition.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Procedure: The only operational procedure for the dam involves the pumping of water from the downstream "pump-back" pool to the main lake to maintain the normal level in the reservoir. This is done by the owner when the water level drops. No records are kept of pool elevations.

4.2 Maintenance of Dam: A complete maintenance program has not been established for the Timber Lake Dam, although periodic maintenance has occured. Daily basis of maintenance such as mowing grass and cleaning out spillway is done by the owner's employees.

4.3 Maintenance of Operating Facilities: The electric motor and pump are maintained by the owner's employees.

4.4 Warning System: There are no warning or evacuation procedures established by the owner to follow in case of an emergency.

4.5 Evaluation: An extensive operation and maintenance program is not required for the dam, however, the owner should initiate an annual maintenance and inspection program designed to maintain the dam and to detect and control potential problems.

SECTION 5

HYDRAULIC/HYDROLOGIC DATA

5.1 Design: None were available.

5.2 Hydrologic Records: None were available.

5.3 Flood Experience: The maximum known flood at the dam was at the time of the Tropical Storm Agnes in 1972. The original emergency spillway was washed out by the flood. The existing principal spillway and emergency spillway were added after the flood. There is no known report detailing the extent of the damage caused by the flood.

5.4 Flood Potential: The PMF, 1/2 PMF and 100-year storm were developed and routed through the reservoir by use of the HEC-1 computer program (Reference 2, Appendix IV) and appropriate unit hydrograph, precipitation, and storage-outflow data. Clark's Tc and R coefficients for the local drainage area were estimated from basin characteristics. The rainfalls applied to the developed unit hydrograph were obtained from the U S Weather Bureau Publications, Hydrometeorological Report No. 33 (Reference 3, Appendix IV) for PMP and Technical Paper No. 40 (Reference 4, Appendix IV) for 100 year storm. Losses were estimated at an initial loss of 1.0 inch and a constant loss thereafter of 0.05 inch/hour for PMF and 0.15 inch/hour for 100-year storm.

5.5 Reservoir Regulation: Pertinent dam and reservoir data are shown in Table 1.1.

Water flows over the principal spillway to South Fork Run in the event water in the Timber Lake rises above elevation 341.0. The principal spillway is a concrete box inlet structure with an opening of 1-foot x 2-feet on three sides. Two 24-inch diameter pipes run through the dam to the South Fork Run. Water also flows past the dam over the emergency spillway when water in the lake rises above elevation 344.50.

The reservoir storage curve was calculated by use of the U S Geological Quandrangle Maps. Rating curves were developed for the principal spillway, emergency spillway and non-overflow section of the dam. In routing hydrographs through the reservoir, it was assumed that the initial pool level was at the principal spillway crest and that the flow was routed through the principal and emergency spillways.

5.6 Overtopping Potential: The probable rise of the reservoir and other pertinent information on reservoir performance is shown in the following table:

Table 5.1 RESERVOIR PERFORMANCE

Item	Normal Flow	Hydrograph 100 Yr. Storm	Hydrograph 1/2 PMF	Hydrograph PMF (c)
Peak Flow, cfs				
Inflow	3	440	848	1697
Outflow	3	53	487	1502
Maximum Pool Elevation, Ft., MSL	341	343	345.2	345.9
Emergency Spillway (El. 344.5)				
Depth of Flow, Ft.(a)	--	--	0.5	0.9
Velocity, fps(b)	--	--	2.3	5.5
Non-Overflow Section (El. 345.0)				
Depth of Flow, Ft.(a)	--	--	0.1	0.6
Duration, Hours	--	--	0.3	1.0
Velocity, fps(b)	--	--	2.0	4.3
Tailwater Elevation, Ft., MSL	295±			

(a) Critical Depth
(b) Velocity at critical Depth
(c) The PMF is an estimate of flood discharge that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonable possible in the region.

(d) The 100 year flood has 1 chance in 100 of occurring in any given year.

5.7 Reservoir Emptying Potential: A 4-inch diameter pipe with the invert elevation above the normal water level and a pump at the downstream slope of the embankment are available for dewatering the reservoir. The pump is used to start siphoning water from the reservoir. The pipe will permit withdrawal of about 25.0 c.f.s. with the reservoir level at the principal spillway crest and essentially dewater the reservoir in about 25 days.

5.8 Evaluation: Based on the size (small) and hazard (significant) classifications, the recommended Spillway Design Flood is 100-year to 1/2 PMF. Based on the risk involved in this project, it is considered 100-year is appropriate as a Spillway Design Flood. The principal spillway and emergency spillway will pass 100-year flood or 80% of the 1/2 PMF without overtopping the dam. The 1/2 PMF will overtop the dam for 0.3 hours and reach a maximum of 0.2 feet over the top of the dam, with an average critical velocity of 2.0 feet per second.

Conclusions pertain to present day conditions. The effect of future development on the hydrology has not been considered.

SECTION 6

STRUCTURAL STABILITY

*6.1 Foundation and Abutments: No subsurface investigation was conducted in conjunction with the design of the dam. Therefore, the nature and extent of the dam foundation and embankment materials is uncertain. It is known however, that construction of the cutoff trench did not extend to the bedrock.

6.2 Embankment:

*6.2.1 The embankment was constructed as a homogeneous dam with a shallow cutoff trench. The origin and nature of the embankment materials, which were not obtained at the site, is unknown. The dam was constructed to a maximum height of about 30 feet with a 12-foot crest and with a 3(H):1(V) upstream slope and a 2(H):1(V) downstream slope.

*6.2.2 The entire toe of the dam was very spongy and wet with evidence of sloughing. At the base of the right abutment there is a pool with out 0.5 gpm flowing into it. Although dams that are built without internal drains do sometimes seep, an investigation should be conducted to determine the effect of the seepage on the stability of the dam. Evidence of ground movement was also noted on the downstream slope at the time of inspection.

*6.3 Evaluation: The steepness of the downstream slope and evidence of moving and sloughing indicate that the dam may be unstable. In addition, the observed seepage also indicated potential stability problems.

*Information provided by Law Engineering Associates of Virginia.

SECTION 7

ASSESSMENT AND REMEDIAL MEASURES/RECOMMENDATIONS

*7.1 Dam Assessment: The details of construction and the present condition of the dam are not known. Conditions observed at the time of the inspection indicate that the dam may be unstable. There is evidence that the downstream slope may be moving. In addition, seepage and sloughing of the downstream slope were observed. The adequacy at the cutoff trench is also questionable. Seepage through the embankment or the foundation may have reduced the dam stability or could lead to the possibility of a piping failure. Further evidence of seepage may be masked by the trees and undergrowth on the dam embankment.

7.1.2 Since the visual inspection revealed problems (seepage, sloughing) that question the stability of the dam it is recommended that the owner conduct further studies to determine the stability. It is recommended that further study include test borings along the crest and on the downstream face of the dam. Observation wells should be installed in these borings to permit monitoring of the phreatic surface within the dam. In addition, laboratory tests of the embankment and foundation soils should be conducted for use in the stability analysis.

7.1.3 Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE) the Spillway Design Flood is the 100-year flood. The principal spillway, together with the emergency spillway, will pass 155% of the Spillway Design Flood without overtopping the dam. The spillway is therefore considered adequate.

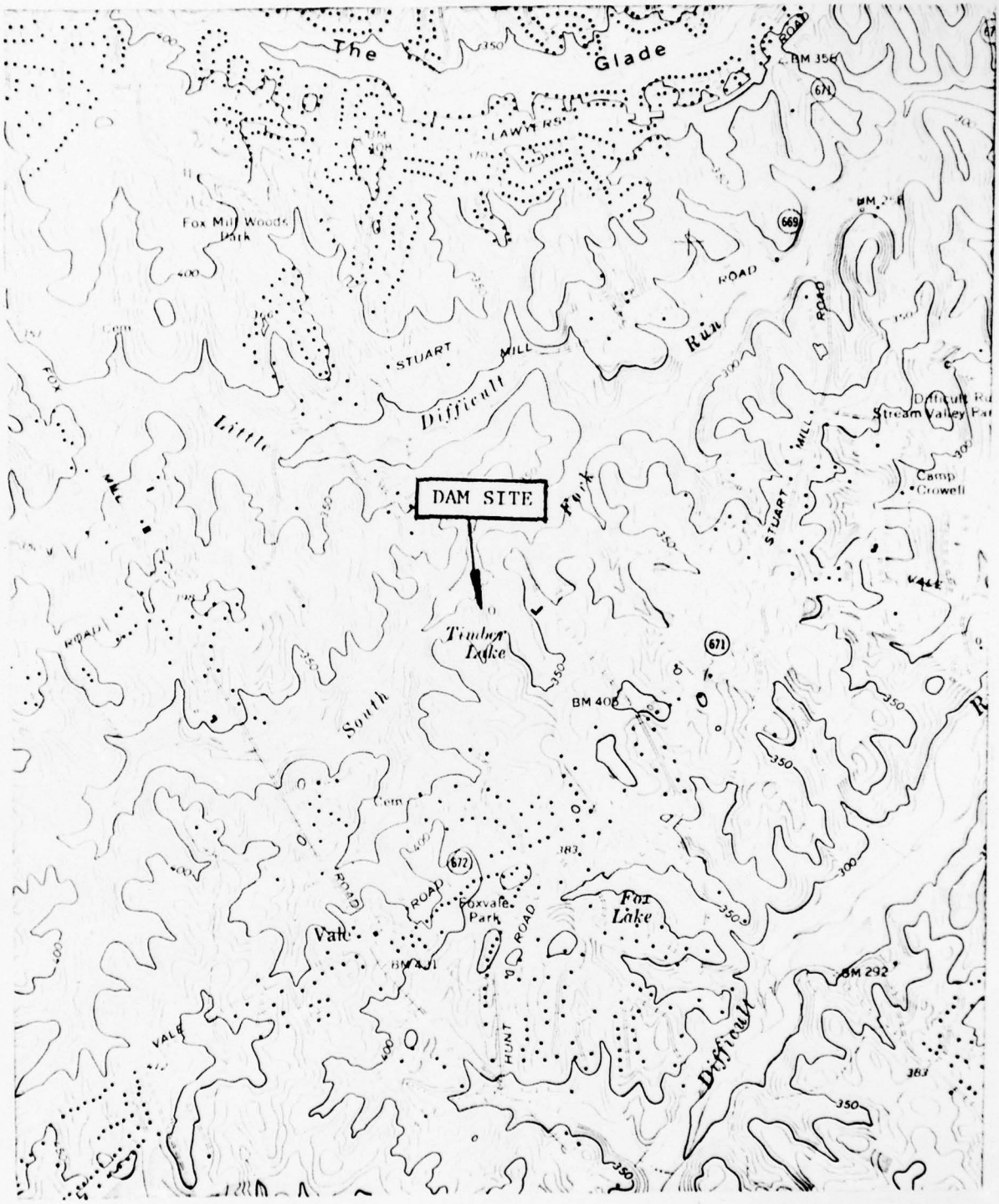
7.2 Remedial Measures/Recommendations: Action should be taken to determine the stability of the dam. It is recommended that samples of soil from the embankment and foundation be analyzed in the laboratory for use in a stability analysis and that remedial actions resulting from this further investigation be implemented. The owner should, through his regularly scheduled maintenance program, repair the gullies and sloughing in the embankment. The seepage and possible movement of the embankment should also be monitored to determine their effect on the stability of the embankment.

***Information provided by Law Engineering Associates of Virginia.**

APPENDIX I

MAPS AND DRAWINGS

REGIONAL MAP
TIMBER LAKE DAM



VIENNA, VA.—MD.

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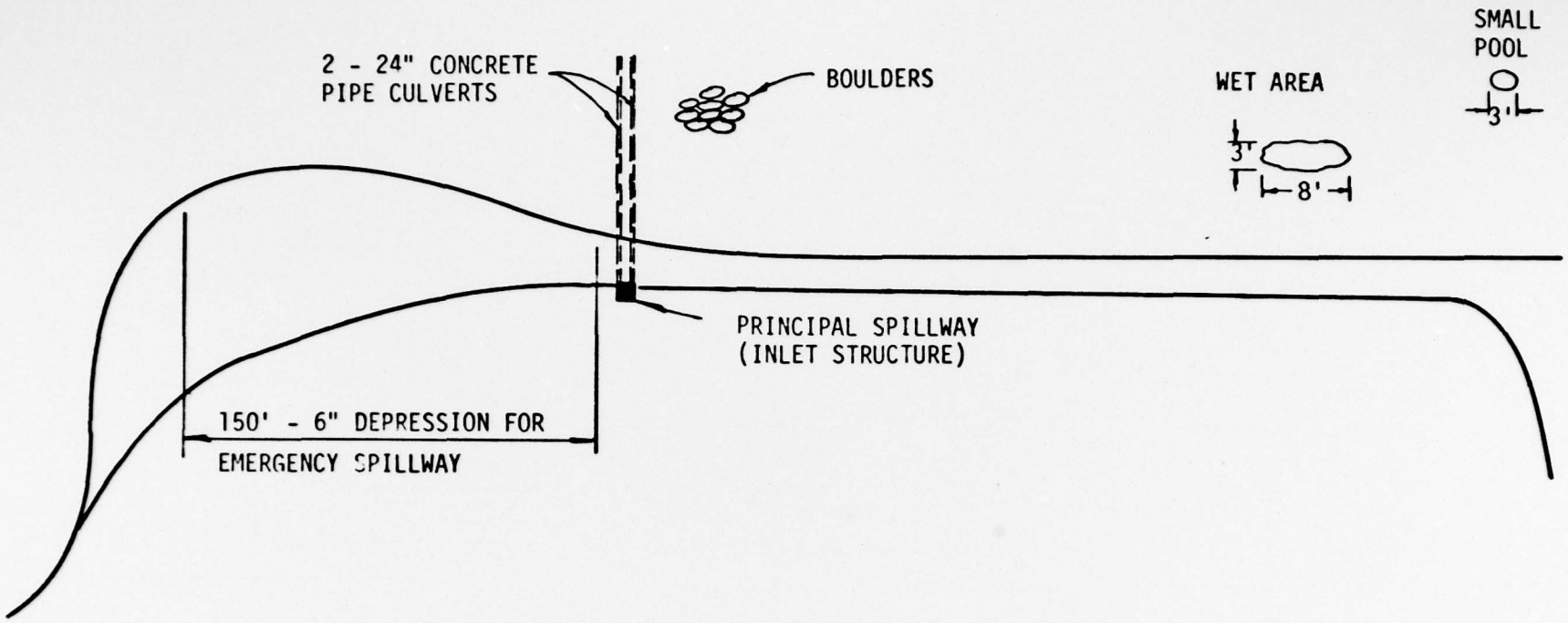
1973

AMS 5561 IV NE—SERIES V834

Scale: 1" = 2000'
10' Contours

VICINITY MAP
TIMBER LAKE DAM

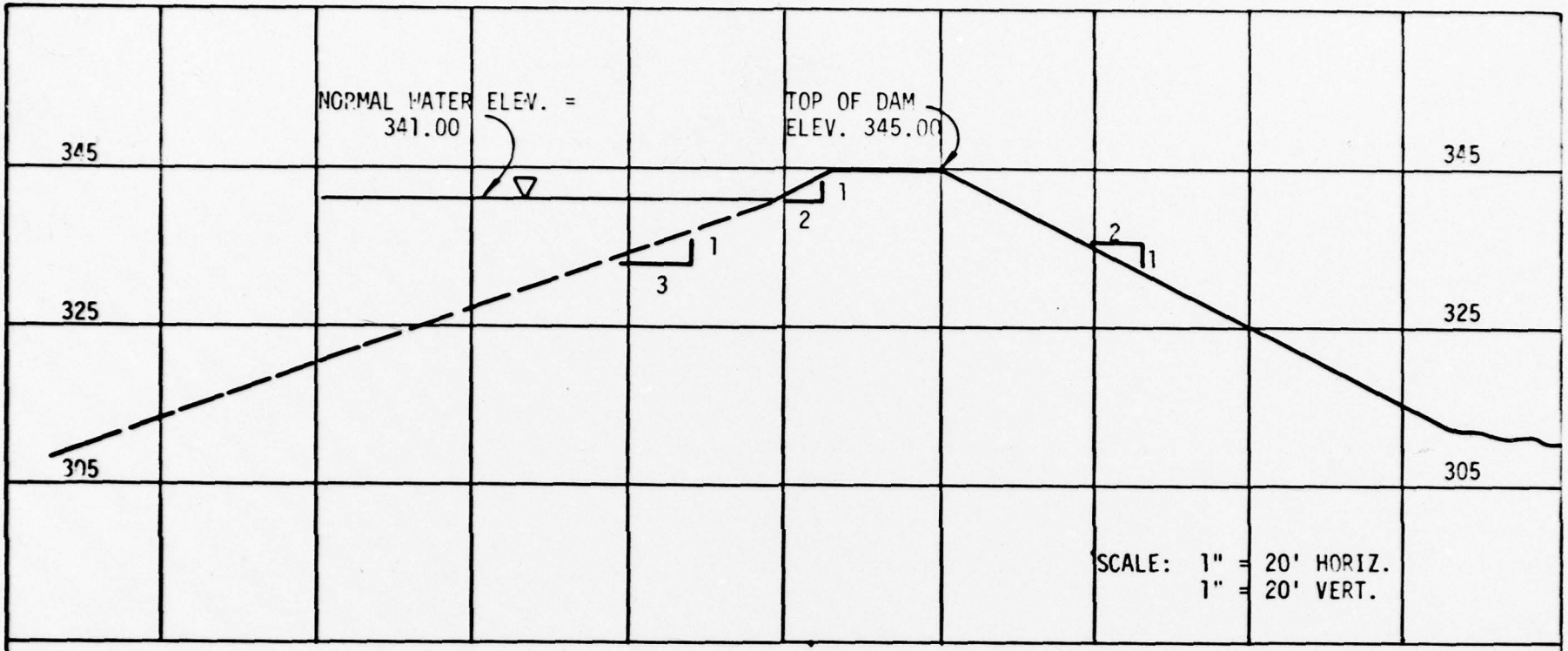


SKETCH OF PLAN VIEW
FOR
TIMBER LAKE DAM

Prepared By

Deward M. Martin & Associates, Inc.
Busch Corporate Center
300 McLaw's Circle, Suite 201
Williamsburg, Virginia 23185

NOT TO SCALE



SKETCH OF
TYPICAL CROSS-SECTION
TIMBER LAKE DAM

Prepared By

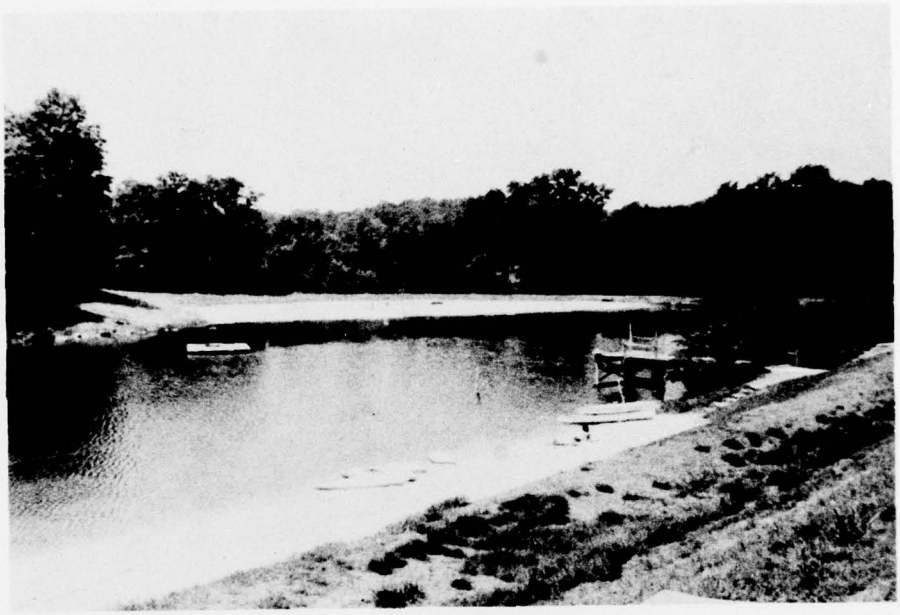
Deward M. Martin & Associates, Inc.
Busch Corporate Center
300 McLaw's Circle, Suite 201
Williamsburg, Virginia 23185

APPENDIX II

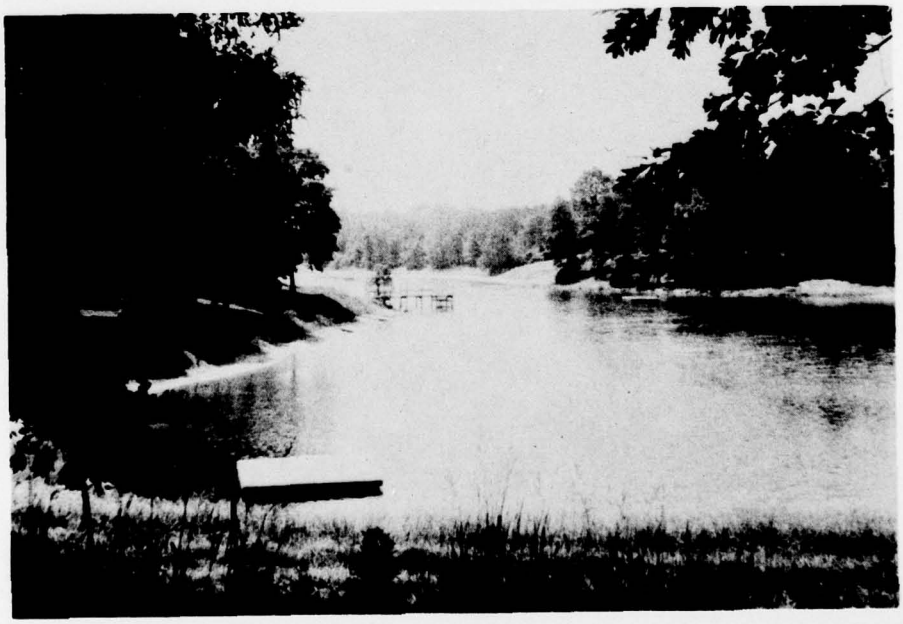
PHOTOGRAPHS

PHOTOGRAPH NO. 1
Upstream Face of Dam

PHOTOGRAPH NO. 2
Principal Spillway Intake Structure



PHOTOGRAPH NO. 3
Emergency Spillway



PHOTOGRAPH NO. 4
View of Lake

PHOTOGRAPH NO. 5
Principal Spillway Outlet Pipe

PHOTOGRAPH NO. 6
Downstream

APPENDIX III

FIELD OBSERVATIONS

Check List
Visual Inspection
Phase I

Name Timber Lake Dam County Fairfax State Virginia Coordinates 3854.2 Lat. 7721.5 Long.

Date(s) Inspection 5/29/79 Weather Clear Temperature 70° F

Pool Elevation at Time of Inspection 341 M.S.L. Tailwater at Time of Inspection 295 M.S.L.

Inspection Personnel:

Bert Black, Law Engineering
Mr. Joe Young, Owner
Ian Young, DMMA
Hugh Gildea, SWCB

Paul Seiler, DMMA Recorder

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	No surface cracks visible	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None Visible	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	None visible on abutment slopes. Numerous trees growing on downstream slope. Slough on downstream slope at wet spot (see seepage). Small gullies, about 1 ft. deep, run from the crest down, on the downstream slope.	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	No horizontal miaslignment visible. No obvious vertical misalignment.	
RIPRAP FAILURES	Not much riprap visible.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONSTRUCTION MATERIAL	Unknown source	
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No visible cracking at abutments.	Wet spot 50' from pump which is 120' from right abutment. 12' vert. down from dam crest is wet line and a slough. History 1972 flood washed out the emergency spillway. Water remained 18" below the top of the dam when flooding.
ANY NOTICEABLE SEEPAGE	Wet spot on down stream slope 30± down slope and 100 ± feet from right abutment	
STAFF GAGE AND RECORDER	None	
DRAINS	None visible	
FOUNDATION		

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None.	
OBSERVATION WELLS	None visible.	
WIERS	None.	
PIEZOMETERS	None.	
OTHER		

EMERGENCY SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR		
APPROACH CHANNEL	150-foot wide grass channel, 6" below elevation of the dam. A small sandy area at the water line is used as a beach.	
DISCHARGE CHANNEL		
BRIDGE AND PIERS	None.	

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	None visible at lake level	
INTAKE STRUCTURE	Concrete drop inlet open on 3 sides with six 1-foot x 2-foot openings.	Observation made from top of drop inlet.
OUTLET STRUCTURE	Two 24-inch diameter pipes from drop inlet. 4-inch pipe to siphon to lower lake	4" pipe to siphon.
OUTLET CHANNEL	Over grown with bushes.	
EMERGENCY DRAWDOWN	Small electric pump can be used to siphon water from reservoir or pump water into reservoir.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Wooded and fairly flat.	
SEDIMENTATION	Unknown.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Heavy growth of bushes.	
SLOPES	Side slopes approximately 10%.	
APPROXIMATE NO. OF HOMES AND POPULATION		

APPENDIX IV

REFERENCES

LIST OF REFERENCES

1. U S Weather Bureau and U S Army Corps of Engineers, "Seasonal Variation of Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24 and 48 Hours", Hydrometeorological Report No. 33, Washington, D.C., April 1956.

2. Clark, C.O., "Storage and the Unit Hydrograph", Trans. American Society of Civil Engineers, Vol. 110, PP. 1419-1488, 1945.

3. Hershfield, David M., "Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years", Cooperative Studies Section, U S Weather Bureau Technical Pater No. 40, Washington, D.C. 1961

4. Standard Project Flood Determinations, Civil Engineer Bulletin No. 52-8, EM 1110-2-1411, Department of the Army, Office of the Chief of Engineers, Washington, D.C., March 1952.

5. Recommended Guidelines for Safety Inspection of Dams, Department of the Army, Office of the Chief of Engineers, Wahsington, D.C. 20314